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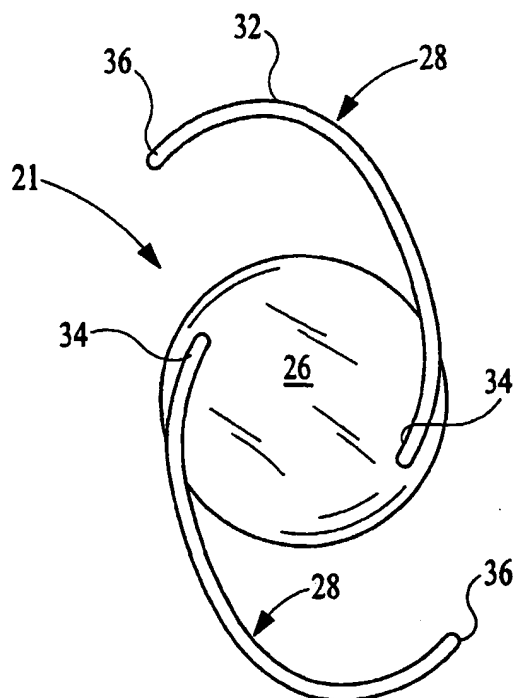
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- (72) Inventors: MAKKER, Harish, C.; 27371 Osuna, Mission Viejo, CA 92691 (US). LIAO, Xiugao; 24 Del Ventura, Irvine, CA 92606 (US). WEINSCHENK, Joseph, I., III; 37 Dover Place, Laguna Niguel, CA 92677 (US).
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(54) Title: INTRAOCULAR LENSES MADE FROM POLYMERIC COMPOSITIONS



(57) Abstract: Ophthalmic lenses, such as intraocular lenses, include cross-linked polymeric materials having a first constituent derived from a first monomeric component selected from the group consisting of acrylates, methacrylates and mixtures thereof, and a second constituent derived from a second component in an amount effective as a cross linker in the cross-linked polymeric material. The cross-linked polymeric material has branched chain alkyl groups, preferably included with at least a portion of the first monomeric component, in an amount effective to reduce the tackiness of the cross-linked polymeric material relative to a substantially identical cross-linked polymeric material without the branched chain alkyl groups.

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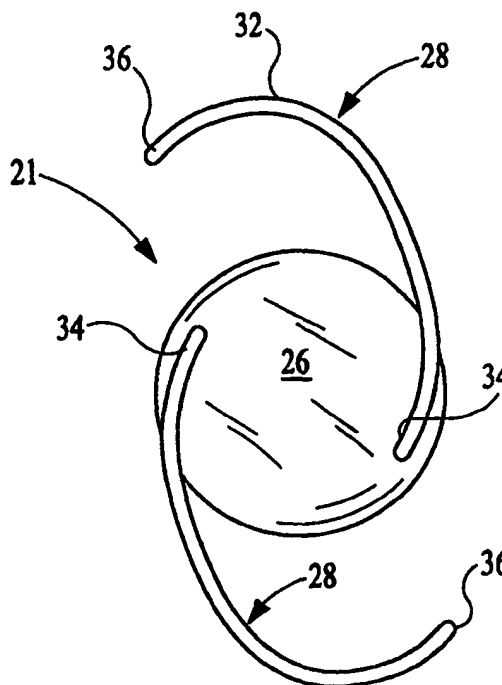


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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**(54) Title:** INTRAOCULAR LENSES MADE FROM POLYMERIC COMPOSITIONS**(57) Abstract**

Ophthalmic lenses, such as intraocular lenses, include cross-linked polymeric materials having a first constituent derived from a first monomeric component selected from the group consisting of acrylates, methacrylates and mixtures thereof, and a second constituent derived from a second component in an amount effective as a cross linker in the cross-linked polymeric material. The cross-linked polymeric material has branched chain alkyl groups, preferably included with at least a portion of the first monomeric component, in an amount effective to reduce the tackiness of the cross-linked polymeric material relative to a substantially identical cross-linked polymeric material without the branched chain alkyl groups.



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## AMENDED CLAIMS

[received by the International Bureau on 11 May 2000 (11.05.00);  
original claims 1, 4, 15 and 20 amended; original claims 18 and 19 cancelled;  
claims 21-24 added; remaining claims unchanged (5 pages)]

1. An ophthalmic lens body comprising a cross-linked polymeric material comprising a first constituent derived from a first monomeric component selected from the group consisting of acrylates, methacrylates and mixtures thereof, and a second constituent derived from a second monomeric component in an amount effective as a crosslinker in the cross-linked polymeric material, at least a portion of the first monomeric component includes branched chain alkyl groups and provides about 1% or less to about 25% by weight of the cross-linked polymeric material, the cross-linked polymeric material having branched chain alkyl groups in an amount effective to reduce the tackiness of the cross-linked polymeric material relative to a substantially identical cross-linked polymeric material without the branched chain alkyl groups.

2. The ophthalmic lens body of claim 1 which is selected from the group consisting of optics of intraocular lenses, contact lenses and corneal implants.

3. The ophthalmic lens body of claim 1 which is a deformable optic of an intraocular lens.

4. The ophthalmic lens body of claim 1 wherein the at least a portion of the first monomeric component including branched chain alkyl groups provides about 3% to about 25% by weight of the cross-linked polymeric material.

5. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material includes a third constituent derived from a third monomeric component, other than the first and second monomeric components, selected

from the group consisting of acrylates, methacrylates and mixtures thereof.

6. The ophthalmic lens body of claim 4 wherein the cross-linked polymeric material includes a third constituent derived from a third monomeric component, other than the first and second monomeric components, selected  
5 from the group consisting of acrylates, methacrylates and mixtures thereof.

7. The ophthalmic lens body of claim 6 wherein the first monomeric component is selected from the group consisting of acrylates having a branched chain alkyl group and mixtures thereof and the third monomeric component is  
5 selected from the group consisting of methacrylates and mixtures thereof.

8. The ophthalmic lens body of claim 1 wherein the branched chain alkyl groups are selected from the class consisting of alkyl groups having 3 to about 20 carbon atoms and mixtures thereof.

9. The ophthalmic lens body of claim 1 wherein the branched chain alkyl groups are selected from the class consisting of about 6 to about 15 carbon atoms and mixtures thereof.

10. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material has an index of refraction of at least about 1.50.

11. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material includes aryl-containing groups in an amount effective to increase the index of refraction of the cross-linked polymeric material relative

- 5 to the index of refraction of a substantially identical cross-linked polymeric material without the aryl-containing groups.

12. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material has a glass transition temperature of about 22°C or less.

13. The ophthalmic lens body of claim 1 which is substantially homogeneous.

14. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material is substantially free of hydrophilic groups effective to reduce the tackiness of the cross-linked polymeric material.

15. The ophthalmic lens body of claim 1 wherein the at least a portion of the first monomeric component including branched chain alkyl groups is selected from the group consisting of 2-ethylhexyl acrylate, 2-ethylhexyl methacrylate, 2,2-dimethylpropyl acrylate, 2,2-dimethylpropyl methacrylate, trimethylcyclohexyl acrylate, trimethylcyclohexyl methacrylate, isobutyl acrylate, isobutyl methacrylate, isopentyl acrylate, isopentyl methacrylate and mixtures thereof.

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16. The ophthalmic lens body of claim 1 wherein the second monomeric component is selected from the group consisting of tetraethylene glycol dimethacrylate, alkyl acrylate, alkyl methacrylate, trifunctional acrylates, trifunctional methacrylates, tetrafunctional acrylates, tetrafunctional methacrylates and mixtures thereof.

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17. The ophthalmic lens body of claim 5 wherein the third monomeric component is selected from the group

consisting of benzyl acrylate, benzyl methacrylate, phenyl acrylate, phenyl methacrylate, phenoxy alkyl acrylates, phenoxy alkyl methacrylates, carbazole acrylates, carbazole methacrylates, biphenyl acrylates, biphenyl methacrylates, naphthyl acrylates, naphthyl methacrylates and mixtures thereof.

18. Cancel

19. Cancel

20. An intraocular lens sized and adapted to be deformed for insertion through an incision into a mammalian eye, the intraocular lens comprising a cross-linked polymeric material comprising a first constituent derived from a first monomeric component selected from the group consisting of acrylates having a branched chain alkyl group, methacrylates having a branched chain alkyl group and mixtures thereof, a second constituent derived from a second monomeric component in an amount effective as a cross linker in the cross-linked polymeric material, and a third constituent derived from a third monomeric component, other than the first and second monomeric components, the homopolymers of which have an index of refraction of at least about 1.50, the first monomeric component provides about 1% or less to about 25% by weight of the cross-linked polymeric material, the cross-linked polymeric material having branched chain alkyl groups in an amount effective to reduce the tackiness of the cross-linked polymeric material relative to a substantially identical cross-linked polymeric material without the branched chain alkyl groups.

21. The ophthalmic lens body of claim 1 wherein the cross-linked polymeric material is substantially free of a fluoro-containing constituent.



25           22. The intraocular lens of claim 20 wherein the  
cross-linked polymeric material is substantially free of a  
fluoro-containing constituent.

30           23. The intraocular lens of claim 20 wherein the  
first monomeric component provides about 3% to about 25% by  
weight of the cross-linked polymeric material.

35           24. The intraocular lens of claim 20 wherein the  
first monomeric component is selected from the group  
consisting of 2-ethylhexyl acrylate, 2-ethylhexyl  
methacrylate, 2,2-dimethylpropyl acrylate, 2,2-  
dimethylpropyl methacrylate, trimethylcyclohexyl acrylate,  
trimethylcyclohexyl methacrylate, isobutyl acrylate,  
isobutyl methacrylate, isopentyl acrylate, isopentyl  
40 methacrylate and mixtures thereof.

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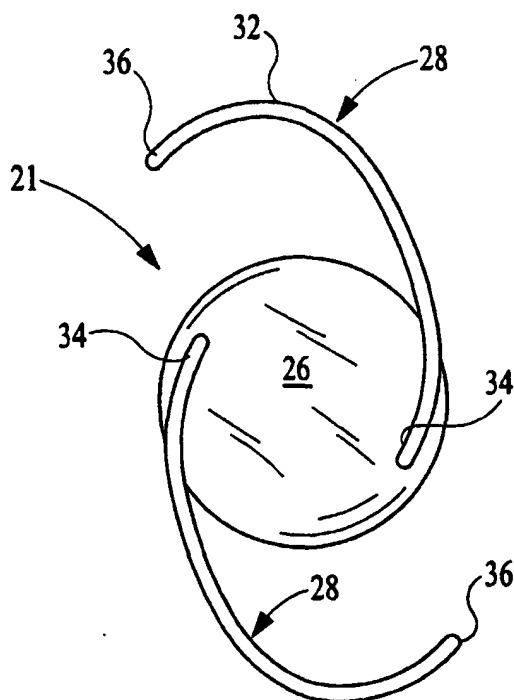
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